



First Five-Year Review Report

for

H. Brown Company, Inc. Site

Walker

Kent County, Michigan

March 2004

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Five-Year Review Report

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List of Acronyms

ARAR	Applicable or relevant and appropriate requirement
CD	Consent Decree
CERCLA	Comprehensive Environmental Response Compensation Liability Act
EPA	Environmental Protection Agency
MCL	Maximum Contaminant Level
MDNR	Michigan Department of Natural Resources
MDEQ	Michigan Department of Environmental Quality
MDOT	Michigan Department of Transportation
mg/kg	Milligram Per Kilogram
NCP	National Contingency Plan
NPL	National Priorities List
PCB	Polychlorinated Biphenyls
ppb	Parts Per Billion
ppm	Parts Per Million
PRP	Potentially Responsible Party
PDFI	Pre-Design Field Investigation
RD/RA	Remedial Design/Remedial Action
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
SVOC	Semi-Volatile Organic Contaminants
UAO	Unilateral Administrative Order
USACE	United States Army Corps of Engineers
UTL	Upper Tolerance Level
VOC	Volatile Organic Chemical

Executive Summary

The constructed remedy for the H. Brown Company, Inc., Site, located in Walker, Michigan included the following components:

- Consolidating contaminated surface soil and sediment requiring cleanup onto the H. Brown property (2200 Turner Avenue N.W.);
- Redevelopment of the site, by private parties, with warehousing facilities constructed above the contaminated soil;
- A cover system comprised of clean fill to develop appropriate grades and elevations, concrete slab foundations, asphalt parking areas, and landscaped areas;
 - Contaminated areas to be covered by concrete slab foundations will at a minimum be covered by, from top to bottom, six (6) inches of concrete and eighteen (18) inches of clean, compacted fill;
 - Contaminated areas to be covered by asphalt will, at a minimum be covered by, from top to bottom, three (3) inches of asphalt, eight (8) inches of road gravel, and thirteen (13) inches of clean, compacted, sub-base material; and,
 - Contaminated soils to be covered by landscaping shall be covered by at least 3 feet of clean fill;
- Long-term maintenance of the cover system to ensure that the cover will continue to prevent direct contact with contaminated soil and minimize infiltration of precipitation;
- Long-term monitoring of the shallow and intermediate aquifers to monitor the effectiveness of the remedy;
- Monitoring and/or treatment of landfill gas;
- Restricting the use of the land and the groundwater;
- Demolishing on-site buildings to accommodate redevelopment;

The purpose of the remedy selected in the February 25, 1998 ROD Amendment was to facilitate the re-development of the H. Brown Co., Inc., Site. If re-development were not to occur or proves to be unsuccessful then the remedy selected in the September 29, 1995 ROD Amendment will be implemented. No state or federal Superfund money was to be used to pay

for the redevelopment of the Site. If redevelopment of the site by a private party were not to occur, a cap consistent with the closure requirements of Part 115 of the Michigan Natural Resources and Environmental Protection Act, 1994 PA 451 (Act 451 Part 115) will be constructed over the contaminated soil.

The site achieved construction completion with the signing of the Preliminary Closeout Report on September 19, 2000. The trigger action for this five-year review was the Remedial Action start date of May 28, 1999.

The remedy at the H. Brown Company, Inc., Site is protective of human health and the environment in the short term because there is no evidence of cap breach and thus no current exposure. However, for the remedy to remain protective institutional controls must be put in place.

Five-Year Review Summary Form

SITE IDENTIFICATION

Site name (from WasteLAN): H. Brown Co., Inc.

EPA ID (from WasteLAN): MID17075136

Region: 5

State: MI

City/County: Walker, Kent County

SITE STATUS

NPL status: ☒ Final ☐ Deleted ☐ Other (specify) _____

Remediation status (choose all that apply): ☐ Under Construction ☒ Operating ☐ Complete

Multiple OUs? ☐ YES ☒ NO

Construction completion date: 09/19/2000

Has site been put into reuse? ☒ YES ☐ NO

REVIEW STATUS

Lead agency: ☒ EPA ☐ State ☐ Tribe ☐ Other Federal Agency _____

Author name: Timothy J. Prendiville

Author title: Remedial Project Manager

Author affiliation: U.S. EPA

Review period:** 02/11/2004 to 05/1/2004

Date(s) of site inspection: 04/13/2004

Type of review:

☒ Post-SARA ☐ Pre-SARA ☐ NPL-Removal only
☐ Non-NPL Remedial Action Site ☐ NPL State/Tribe-lead
☐ Regional Discretion

Review number: ☒ 1 (first) ☐ 2 (second) ☐ 3 (third) ☐ Other (specify) _____

Triggering action:

☐ Actual RA Onsite Construction at OU # _____ ☒ Actual RA Start at OU# _____
☐ Construction Completion ☐ Previous Five-Year Review Report
☐ Other (specify) _____

Triggering action date (from WasteLAN): 05/28/99

Due date (five years after triggering action date): 05/28/2004

* ["OU" refers to operable unit.]

** [Review period should correspond to the actual start and end dates of the Five-Year Review in WasteLAN.]

Five-Year Review Summary Form, cont'd.

Issues:

There has been no documentation of periodic inspections which are required to be performed by the PRPs.

Lead groundwater cleanup standard needs evaluation. The original standard was based on groundwater samples from two background wells the results of which do not correlate with the last several rounds of data from upgradient wells at the site

Deed restrictions have not been put in place on the Baker Auto or Visser properties where contaminated soils were left in place.

A standard needs to be developed to determine when cracks in the cover need to be addressed.

Recommendations and Follow-up Actions:

The PRPs should be required to submit copies of all inspection logs to the agencies along with the semi-annual inspection reports.

EPA should perform an analysis of the lead groundwater standard to determine if the use of background is still appropriate.

The property owner at the Baker Auto parcel should place the required deed restrictions on the property.

PRPs should propose a standard to be incorporated into the existing O&M plans to determine when cracks in the cover need to be addressed.

Protectiveness Statement(s):

The remedy at the H. Brown Company, Inc., Site is protective of human health and the environment in the short term because there is no evidence of cap breach and thus no current exposure. However, for the remedy to remain protective institutional controls must be put in place.

Other Comments:

None

Five-Year Review Report

I. Introduction

The purpose of five-year reviews is to determine whether the remedy at a site is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in Five-Year Review reports. In addition, Five-Year Review reports identify issues found during the review, if any, and recommendations to address them.

The Agency is preparing this five-year review pursuant to CERCLA §121 and the National Contingency Plan (NCP). CERCLA §121 states:

If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.

The agency interpreted this requirement further in the National Contingency Plan (NCP); 40 CFR §300.430(f)(4)(ii) states:

If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.

The United States Environmental Protection Agency (EPA) Region 5 has conducted a five-year review of the remedial actions implemented at the H. Brown Company, Inc., Site, located in Walker, Kent County, Michigan. This review was conducted by the Remedial Project Manager (RPM) from February 2004 through May 2004. This report documents the results of the review.

This is the first five-year review for the H. Brown Company, Inc., Site. The triggering action for this statutory review is the date of the Remedial Action start as shown in EPA's WasteLAN database: May 28, 1999. This review is required because certain response actions are ongoing and hazardous substances, pollutants, or contaminants are or will be left on site above levels that allow for unlimited use and unrestricted exposure.

II. Site Chronology

Table 1: Chronology of Site Events

Event	Date
Area used for waste disposal by City of Grand Rapids	1960 to 1962
Battery reclamation	1961 to 1982
Battery Acid drained in stainless steel tank	After 1978
Site Discovery	1970
NPL listing	06/10/1986
Unilateral Administrative Order #1 for Removal Action	04/12/1991
PRP Removal Actions Completed	09/30/1992
Fund-lead Remedial Investigation/Feasibility Study	09/12/1988 - 09/30/1992
ROD signature (Slurry wall, cap, pump & treat)	09/30/1992
Administrative Order on Consent (Section 122 (G) de minimis, pre-ROD)	02/09/1993
Federal Lead Remedial Design Start	03/30/1993
ROD Amendment #1 (Landfill Cap only)	09/28/1995
Unilateral Administrative Order #2 (RD/RA)	07/01/1996
PRP Remedial Design Takeover Start	08/19/1996
Consent Decree #1 (Settling Past Cost for several PRPs)	08/18/1997
Consent Decree #2 (Settling Past Cost for several PRPs)	12/02/1997
ROD Amendment #2 (Brownfields Redevelopment)	02/25/1998

Table 1: Chronology of Site Events

Event	Date
Unilateral Administrative Order #3 (RD Only)/Withdrawal of UAO #2	04/28/1998
Consent Decree #3 (Settling Past Cost for several PRPs)	05/29/1998
Administrative Order on Consent (Prospective Purchaser Agreement)	08/29/1998
Brownfields Redevelopment Remedial Design	07/12/1998 - 06/04/1999
Explanation of Significant Differences (eliminate several chemicals of concern)	04/05/1999
PRP Remedial Action Start	05/28/1999
Consent Decree #4 (Remedial Action)	12/23/1999
Long-Term Performance Monitoring Begins	September 2000
Final Inspection	05/30/2001
Construction Completion Date	09/19/2000
Remedial Action Completion Report Submitted	December 2003
Remedial Action Report Approved	April 21, 2004

III. Background

Physical Characteristics

The H. Brown Co., Inc., site (Site) is located generally near 2200 Turner Avenue, N.W. in the City of Walker, Kent County, Michigan. Figure 1 is a site location plan and Figure 2 is a diagram of the site.

The Site is located in a light industrial area in Walker, in south central Michigan. A Grand Rapids city park is located east of US-131. Further to the east of the park, approximately 1,000 feet from the site, lies the Grand River. The site is roughly bounded by US-131 on the east and Turner Avenue on the west, but includes one area to the west of Turner Avenue. The site also includes Zenith Auto Parts to the north and the area formerly occupied by Abbott Auto Parts

(formerly Turner Auto Parts) to the south. The site includes the following components (see Figure 2):

- Areas with surface soil contaminated with 500 parts per million (ppm) or more of lead;
- An unnamed drainage ditch east of Zenith Auto Parts;
- A drainage ditch named Cogswell Drain located near the southern boundary of Keizer Equipment Company;
- The storm sewer on Turner Avenue, between Zenith Auto Parts and Cogswell Drain;
- Approximately the northern half of a marshy area within (1) the current, eastern boundary of H. Brown, (2) southbound US-131, (3) Cogswell Drain, and (4) the unnamed drain east of Zenith Auto Parts. This area is also referred to as the "wetland".

The general area of the site was once used as a landfill that received unknown types and quantities of waste. The boundaries of the landfill are not well defined, but they may extend beyond the boundaries of industries surrounding H. Brown.

History of Contamination

Before 1961, Herman Brown operated his property in the site area as an uncontrolled dump. He leased portions of his property to the City of Grand Rapids, which may have used the leased property for the disposal of municipal waste. Between 1961 and approximately 1982, H. Brown reclaimed lead from wet-cell batteries. During that period, up until 1978, the battery acid was reportedly drained directly to the ground before shredding the batteries. The total volume of battery acid disposed of at the site has been estimated between 170,000 and 460,000 gallons. After 1978, battery acid was not drained onto the ground; instead, it was routed to a stainless steel catch pan and tank.

MDNR inspected H. Brown several times during the 1970s. In 1970, MDNR noted acidic waters draining into a ditch that drained into the Grand River. In 1978, MDNR sampled wastewater ponded at the site and found elevated levels of lead, chromium, copper, and nickel.

In the early 1980s, EPA became involved with the site. A site inspection in 1984, found elevated levels of chromium and lead, and an acidic pH in a ditch leading from the site to the Grand River. Subsequently the site was placed on the National Priorities List (NPL) in 1986, making it eligible for further study and cleanup under the EPA Superfund program. After the potentially responsible parties (PRPs) failed to reach an agreement with EPA to conduct an investigation of the site, EPA undertook the study using money from the Superfund. In 1991,

under an administrative order from EPA the PRPs constructed a fence around the area to the north of the H. Brown property to minimize contact with the contaminated soil by the public.

IV. Remedial Actions

Remedy Selection

Record of Decision

On September 30, 1992, a Record of Decision (ROD) addressing the entire site was signed by the Regional Administrator. It addressed contaminated surface and subsurface soils, surface water and sediments, and groundwater. The remedy selected in the ROD was a final remedial action and included the following major components:

- Demolishing buildings to allow cleanup of contaminated soil beneath the structures, and disposal of the debris on-site or in an appropriate off-site landfill.
- Consolidating contaminated surface soil in the area where subsurface soil cleanup will be required.
- Solidifying/stabilizing, in place, contaminated surface and subsurface soil and sediments in a cement-like form.
- Placing a multi-layer cap over the solidified/stabilized soil sufficient to meet the requirements of Michigan's Hazardous Waste Management Act 64 (now known as Part 111 of the Natural Resources and Environmental Protection Act, 1994 PA 451 fact 451 Part 111)
- Surrounding the solidified/stabilized soil with a containment wall.
- Collecting, treating and discharging to the surface water all groundwater and surface water associated with construction.
- Installing additional wells to further define the condition of the intermediate and deep aquifers. This information will be used to determine what, if any, remediation of those aquifers needs to take place. These wells, along with other wells at the site, will be used to monitor the effectiveness of the remedy.
- Restricting the use of the land and the groundwater.
- Maintaining a fence around the site to prevent access.

ROD Amendment #1

On September 29, 1995, a ROD Amendment was issued based upon data from a Pre-Design Field Investigation (PDFI) performed by the U.S. Army Corps of Engineers. That investigation showed that both the solidification of the soils and the construction of a slurry wall are not feasible and are not necessary to achieve protection. The September 1995 ROD Amendment required the implementation of the following components:

- Consolidating contaminated surface soil in the area where subsurface soil cleanup will be required;
- Placing a Michigan Act 451 Part 115 Solid Waste multi layer cap over all soils exceeding 500 parts per million of lead;
- Long-term monitoring of the shallow and intermediate aquifers to monitor the effectiveness of the remedy;
- Restricting the use of the land and the groundwater;
- Maintaining a fence around the site to prevent access;

ROD Amendment #2

On April 14, 1997, U.S. EPA received notice that a Buy and Sell Agreement had been executed between DBV, Inc., and H. Brown Co., Inc., for the properties comprising the Site. The intent of the buyer, DBV, Inc., was to redevelop the property and bring it back into a beneficial use. The redevelopment plan was presented to U.S. EPA in an April 18, 1997 proposal. The proposal included two to three large buildings with concrete foundations, parking facilities and landscaped areas. When constructed, and as long as they are properly maintained, the facilities would serve as an impermeable barrier preventing direct contact with the contaminated soils and would minimize the potential for precipitation to leach through the contaminated material. Erosion and runoff into the adjacent wetlands would also be prevented.

On February 25, 1998, a ROD Amendment was signed providing for the redevelopment of the Site. The major components of the selected remedy are described below. On April 28, 1998, U.S. EPA, withdrew the July 1, 1996 RD/RA UAO, Docket Number V-W-98-C-356 and simultaneously issued a UAO for RD of the brownfields redevelopment remedy. The major components of the February 25, 1998 ROD Amendment for the Site are:

- Consolidation of contaminated surface soil and sediment requiring cleanup onto the H. Brown Co., Inc., property (2200 Turner Avenue N.W.);
- Redevelopment of the Site by private parties with warehousing facilities constructed above the contaminated soil;

- A cover system comprised of clean fill to develop appropriate grades and elevations, concrete slab foundations, asphalt parking areas, and landscaped areas:
 - Contaminated areas to be covered by concrete slab foundations will at a minimum be covered by, from top to bottom, six (6) inches of concrete and eighteen (18) inches of clean, compacted fill;
 - Contaminated areas to be covered by asphalt will, at a minimum be covered by, from top to bottom, three (3) inches of asphalt, eight (8) inches of road gravel, and thirteen (13) inches of clean, compacted, sub-base material; and,
 - Contaminated soils to be covered by landscaping shall be covered by at least 3 feet of clean fill.
- Long-term maintenance of the cover system to ensure that the cover will continue to prevent direct contact with contaminated soil and minimize infiltration of precipitation;
- Long-term monitoring of the shallow and intermediate aquifers to monitor the effectiveness of the remedy;
- Monitoring and/or treatment of landfill gas;
- Restricting the use of the land and the groundwater;
- Demolition of on-site buildings to accommodate redevelopment;
- Cleanup standards for the soil will remain the same as in the 1992 ROD;
- The purpose of the ROD Amendment is to facilitate the redevelopment of the Site and if redevelopment does not occur or proves to be unsuccessful then the remedy selected in the September 29, 1995 ROD Amendment will be implemented. No state or federal Superfund money will be used to pay for the redevelopment of the Site. If redevelopment of the Site by a private party does not occur, a cap consistent with the closure requirements of Part 115 of the Michigan Natural Resources and Environmental Protection Act, 1994 PA 451 Act 451 Part 115, will be constructed over the contaminated soil.

Explanation of Significant Differences

On April 5, 1999, the Superfund Division Director signed an Explanation of Significant Differences for the Site. The purpose of the modification was to adjust the cleanup levels for several contaminants established by the ROD and ROD Amendments. During the RD and the RA Consent Decree negotiations for the Site, U.S. EPA became aware of the need for these modifications. After independently reviewing the PRPs' October 2, 1998 petition to adjust the cleanup parameters, along with other relevant Site information, U. S. EPA determined that these modifications were necessary and appropriate.

Early in the investigations of the Site it was determined that the area in which the Site is located had been used as an uncontrolled dump and was confirmed as part of the PDFI, when three inspection trenches were excavated. The PDFI report concluded, "[t]est trenches show the fill unit to be composed predominately of construction debris and landfill materials such as metal cans, plastic, concrete, brick, wood, and glass." It has also been reported, on several occasions by adjacent property owners, that similar materials were found while digging foundations for their buildings. Landfilled materials are visible at the surface in the Grand River flood plain just east of the Site.

Background data from the RI and PDFI for both groundwater and soils showed several of the semi-volatile organic chemicals (SVOCs) and pesticide contaminants of concern listed in Tables 3 and 4 of the ROD Amendment were related to the landfilling activities, or other sources in the general area of the Site. The contaminants in question are: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, isoprene, chrysene, dibenzo(a,h)anthracene, dieldrin, heptachlor, indeno(1,2,3-c,d) pyrene. The remedy addresses contaminants from the battery breaking operation only and not those contaminants related to the landfilling activities. Based on the nature of the business of the battery breaking operation these contaminants would not have been generated as part of that business. For these reasons the following contaminants were removed from the lists of cleanup levels for groundwater and soil:

Groundwater	Soil
Benzo(a)anthracene	Benzo(a)anthracene
Benzo(a)pyrene	Benzo(a)pyrene
Benzo(b)fluoranthene	Benzo(b)fluoranthene
Benzo(k)fluoranthene	Benzo(k)fluoranthene
Chrysene	Chrysene
Dibenzo(a,h)anthracene	Dibenzo(a,h)anthracene
Dieldrin	Isoprene
Heptachlor	Indeno(1,2,3-c,d)pyrene
Indeno(1,2,3-c,d)pyrene	

Enforcement

Removal Unilateral Administrative Order

On April 12, 1991, U.S. EPA issued a Unilateral Administrative Order (UAO) to ten PRPs. The UAO required the parties to erect a fence around the entire site and implement a dust control program. Two parties complied with the UAO, erecting a fence with a windskirt and performing limited air monitoring.

Pre-ROD 122(g) De Minimis Settlement

Following completion of the Remedial Investigation/Feasibility Study, U.S. EPA sent general notice letters and recovered approximately \$600,000 from de minimis parties. U.S. EPA originally sent general notice letters to approximately 1,500 PRPs. A generator ranking had been developed for the 1,500 parties based on volume of batteries each PRP sent to the Site. The Administrative Order on Consent was completed on February 9, 1993.

1996 RD/RA Unilateral Administrative Order

On November 6, 1992, Special Notice Letters were issued to 115 major PRPs offering them the opportunity to undertake the Remedial Design/Remedial Action (RD/RA). On March 18, 1993, the 120 day negotiation moratorium concluded without a settlement. Subsequently, on March 30, 1993, U.S. EPA initiated a fund-lead RD under an Interagency Agreement with the U.S. ACE. On September 29, 1995, a ROD Amendment was issued by U.S. EPA. On July 1, 1996 a UAO was issued to 31 PRPs, ordering them to design and implement the new remedy selected in the ROD Amendment.

1997 Unilateral Administrative Order for Remedial Design (Withdrawal of 1996 UAO)

On April 14, 1997, U.S. EPA received notice that a Buy and Sell Agreement had been executed between DBV, Inc., and H. Brown Co., Inc., for the properties comprising the Site. Based on DBV's proposed redevelopment of the Site, U.S. EPA amended the ROD on February 25, 1998 to include redevelopment of the Site. On April 28, 1998, U.S. EPA, withdrew the July 1, 1996 RD/RA UAO, Docket Number V-W-98-C-356 and simultaneously issued a UAO for the remedial design of the brownfields redevelopment remedy.

Consent Decrees

After issuing the 1996 UAO, U.S. EPA referred its past cost claims to the Department of Justice who filed a complaint against approximately 32 PRPs. That complaint resulted in the execution of four consent decrees. The first three entered by the court on August 18, 1997, December 2, 1997, and May 29, 1998 respectively, were cost recovery settlements resolving the liabilities of 27 of the parties. The fourth Consent Decree resolved the liabilities of the five remaining PRPs and provided for one PRP, General Motors, to implement the remedial action at the Site.

Prospective Purchaser Agreement

On August 29, 1998, EPA entered into a CERCLA Prospective Purchaser Agreement (PPA) with DBV Partners, LLC (DBV) for the redevelopment of the Site. Pursuant to the PPA, the remedial action at the Site will include redevelopment of the Site for commercial and industrial uses including warehousing and related accessory uses, including office space. DBV also agreed to pay \$290,000 which was to be applied to unrecovered past response costs at the Site.

Remedy Implementation

Brownfields Redevelopment Remedy RD/RA

The April 28, 1998 Unilateral Administrative Order was issued to eight parties and required the parties to complete the remedial design for the remedy selected in the February 25, 1998 ROD Amendment (Brownfields Redevelopment). Conestoga-Rovers & Associates (CRA) was designated by General Motors as the engineering firm responsible for the design of the remedy. The Final Remedial Design Work Plan was submitted to the Agency on October 14, 1998. The Preliminary Quality Assurance Project Plan was submitted to the Agency on November 6, 1998, and the Air Monitoring Preliminary Design was submitted on January 8, 1999. The Final 100% Remedial Design was completed and approved on June 4, 1999.

The Brownfield Redevelopment Remedial Design included the construction of three warehouse buildings (approximately 250 ft by 500 ft), parking lots, landfill gas venting and monitoring systems, and landscaping. Demolition and other site preparatory work began in March 1999. Work in Building A area, Phase I (see figure 2), began on March 15, 1999 and was completed in March 2000. Work in Building Area B, Phase II, began in July 1999 and was completed in March 2000. Work in Building Area C, Phase III, began in October 1999 and was completed in February 2001. During the time between March 1999 and February 2001, the asphalt parking lot was constructed as well as the landscaping around the site. The ROD also required restrictive covenants to be placed on the property to prevent exposure to contaminated soils and groundwater. Those restrictions have not yet been placed on the redeveloped parcels.

One component of the cleanup was to consolidate all contaminated soils on to the H. Brown Co., Inc., property. This included contaminated soil located on the Baker Auto property to the east of the site. During the design it was determined impractical to excavate contaminated soils on the property located beneath the shallow water table. Therefore, on the Baker Auto property, all contaminated soils located above the water table were consolidated onto the H. Brown property. Those soils below the water table were covered with 4 inches of sand grading material, 36 inches of clay fill, and 4our inches of topsoil, or 4 inches of sand grading material, 13 inches of sand subbase, 8 inches of gravel and 3 inches of asphalt. Restrictive covenants to that parcel of land were also required to be put in place to prevent exposure to contaminated groundwater and contaminated soils, however, that has yet to be accomplished.

Another area requiring excavation and consolidation was the center ditch area (see figure 3). During RA construction activities soil performance standards were met in the center ditch area with the exception of antimony and arsenic levels. On May 22, 2001, CRA, on behalf of General Motors, submitted a "Final Risk Assessment - Center Ditch Area", which provided an assessment of the risks posed by the residual levels of antimony and arsenic in surface soils located in the center ditch. After review, U.S. EPA and MDEQ accepted the risk assessment and

concluded that the residual contaminant concentrations in the center ditch soils did not pose a health risk for recreational users. No further excavation within the center ditch was necessary. This assessment required the Michigan Department of Transportation (MDOT) place deed restrictions on the MDOT right-of-way to assure the property only be used for recreational purposes. A November 15, 2001 letter from MDOT to the MDEQ certifying that the parcel is a permanent transportation right-of-way and will not be sold or used for other purposes.

The final construction inspection was conducted on May 30, 2001. Representatives from U.S. EPA, MDEQ, General Motors, DBV, and CRA participated in the inspection. The inspection is summarized in a June 27, 2001 letter from CRA to U.S. EPA. All outstanding work items had been completed except for one 25 foot by 25 foot section of concrete in Building C. That work was subsequently certified complete in late 2001. The Construction Completion Report was submitted in July 2001. Long-term performance monitoring (groundwater, surface water and sediment) has been on-going since September 2000.

Operation and Maintenance

The final Operation and Maintenance (O&M) Plan was submitted by CRA, on behalf of GM and DBV, to U.S. EPA on August 24, 2000. Since September 2000 the PRPs have been responsible for performing O&M at the site. The required activities are specified in the August 2000 O&M Plan and the December 3, 1998, "Landfill Gas Venting Design and Monitoring Plan". The required activities include routine inspections of the concrete, asphalt, and landscaped cover, and the landfill gas venting system; maintenance and repairs based on observations made during the routine inspections; and conduct emergency repairs. The O&M Plan requires the PRPs to perform at least semi-annual inspections to be recorded on the "Semi-Annual Inspection Log". However, during this review it was determined that DBV Inc., has failed to present to U.S. EPA any inspection logs or evidence of the semi-annual inspections.

The PRPs are also required to perform periodic monitoring of groundwater, surface water, and sediments, in accordance with the March 15, 1999, "Performance Standards, Verification Plan (PSVP)". Groundwater from six upgradient monitoring wells and six downgradient monitoring wells is regularly sampled and analyzed for the site specific parameters, antimony, arsenic, cadmium, lead, nickel, vanadium, zinc, benzene, and bis(2-ethylhexyl)phthalate. Surface water and sediment samples are collected from two downgradient locations and analyzed for the site specific parameters, antimony, arsenic, cadmium, lead, nickel, vanadium, zinc, benzene, and bis(2-ethylhexyl)phthalate. Sampling occurred on a quarterly basis between September 2000 to September 2002. The frequency was reduced to an annual basis in September 2003.

The PRPs were also required to perform periodic monitoring for landfill gas within the on-site buildings. Landfill gas was identified as a potential issue at the site because the site area had been used for landfilling in the 1960s. In 1997 the PRPs performed a landfill gas investigation consisting of 21 test pits and 8 soil gas probe locations. Air monitoring data from the test pits detected no measurable gas emissions. Methane was detected during sampling of several test pits. The study concluded that gas generation is not significant in quantity and is not producing

increased internal gas pressure in the subsurface and therefore did not pose a threat to the interior of the buildings. However, because isolated areas of methane producing biological decay were present, and to be conservative the Agency required the installation of a passive venting system, and implementation of a landfill gas monitoring program. After several rounds of sampling with no measurable detections of landfill gases within the buildings it was agreed in August of 2000 that the PRPs would perform two additional semi-annual monitoring events. The last sampling occurred in May 2003 and no gases were detected in any of the buildings. It was agreed that the monitoring would be discontinued. That monitoring was discontinued after the May 19, 2003 sampling event.

V. Progress Since the Last Review

This is the first Five-Year Review for the H. Brown Company, Inc. Site

VI. Five-Year Review Process

Administrative Components

The PRPs were notified of the initiation of the five-year review on April 1, 2002. The H. Brown Company, Inc., Site Five-Year Review was led by Tim Prendiville of the U.S. EPA, Remedial Project Manager for the Site and Cheryl Allen, Community Involvement Coordinator. Lisa Summerfield of the MDEQ, assisted in the review as the representatives for the support agency.

The review, which began on February 11, 2004 consisted of the following components:

- Community Involvement;
- Document Review;
- Data Review;
- Site Inspection; and,
- Five-Year Review Report Development and Review.

Community Involvement

Activities to involve the community in the five-year review were initiated with communication in early 2004 between the RPM and the Community Involvement Coordinator (CIC) for the Site. A notice was sent to a local newspaper that a five-year review was to be conducted. The notice was published on February 11, 2004, and invited the public to submit any comments to EPA. The results of the review and the report were made available at the Holly Public Library Rose Township Superfund Site information repository. No public comments were received during this 5-Year Review.

Document Review

This five-year review consisted of a review of relevant documents including O&M records and monitoring data (See Attachment 1). Applicable soil and groundwater cleanup standards, as listed in the ROD were also reviewed (See Attachment 2).

Data Review

The PRPs are required to perform periodic monitoring of groundwater, surface water, and sediments, in accordance with the March 15, 1999, "Performance Standards, Verification Plan (PSVP)", as revised in May 7, 2001. Sampling occurred on a quarterly basis between September 2000 to September 2002. The frequency was reduced to an annual basis in September 2003. Groundwater from six upgradient monitoring wells (MWs 3S, 4S, 5S, 5I, I16, and I17) and six downgradient monitoring wells (MWs 1S, 1I, 2I, S02, and I02) is regularly sampled and analyzed for the site specific parameters, antimony, arsenic, cadmium, lead, nickel, vanadium, zinc, benzene, and bis(2-ethylhexyl)phthalate. Surface water and sediment samples are collected from two downgradient locations and analyzed for the site specific parameters, antimony, arsenic, cadmium, lead, nickel, vanadium, zinc, benzene, and bis(2-ethylhexyl)phthalate.

Groundwater

The December 17, 2003, "September 2003 Monitoring Report", the last monitoring result report, was reviewed as part of this Five-Year Review. That report includes the most recent results from nine groundwater monitoring wells along with groundwater elevations. One well MW 2S could not be sampled due to lack of recharge. Tables 1 through 3 present the results of the September groundwater sampling efforts. Only one performance criteria exceedance was detected in the upgradient monitoring wells. Benzene was detected at MW I16 at a concentration of 2.6 parts per billion (ppb). The performance standard for benzene is 1.0 ppb. Previous rounds of data show that benzene has historically been detected at this well above the performance standard, but below Michigan Part 201 drinking water standard of 5.0 ppb. These data indicate that benzene is migrating from an upgradient source onto the Site. A likely source is the area wide landfill which surrounds the site.

Antimony, arsenic, cadmium, vanadium and bis(2-ethylhexyl)phthalate were not detected in the downgradient wells. Lead was detected in well MW-1S at 3.5 ppb well below the performance standard of 1,420 ppb and below the current Michigan Part 201 drinking water standard of 4.0 ppb. Lead was not detected at any other location. Nickel was detected in well I02 at 10 ppb, lower than the performance standard of 103 ppb. Nickel was not detected at any other location. Zinc was detected at well MW-1I (210 ppb) and well I02 (35 ppb) well below the performance standard of 4,670 ppb and below the current Michigan Part 201 drinking water standard of 2,400 ppb. All other locations were non-detect for Nickel. Benzene was detected in wells MW-1S (0.5 ppb), MW-1I (4.3 ppb), MW-2I (0.75 ppb) and I-02 (1.4 ppb). All of the concentrations are less than the current federal maximum contaminant level (MCL) and the

current Michigan Part 201 drinking water standard of 5.0 ppb. These results are also consistent with the benzene results of 2.8 ppb detected at the upgradient well MW-116 and indicative of source other than the H. Brown Site.

The Performance Standard Verification Plan requires a statistical evaluation of the site analytical data to determine if any significant changes have occurred in groundwater quality at the Site. The evaluation includes the establishment of a baseline of data against which the most current round is compared. The baseline data is used to calculate a 95 percent upper tolerance limit (UTL) for detected parameters which represents the value, with 95 percent confidence, under which 95% of observed values are expected to occur if no change in groundwater quality occurs. A comparison of the current site data against the UTL then provides a measure of changes in groundwater.

The statistical analysis in the 2003 monitoring report found six detected results above the upper tolerance limit. Four of these detections were the first time the parameters were detected in the wells. Only two of the these detections were in downgradient wells. One of these detections was zinc at 210 ppb in downgradient well MW-11. The baseline UTL for this parameter at this location was 110 ppb. Zinc was also detected at MW-102 at 35 ppb, above the baseline UTL of 20 ppb. Both of these detections are below performance standards.

Surface Water

Surface water samples were collected from two location on September 9, 2003; SW-1 and SW-2. The samples were analyzed for antimony, arsenic, cadmium, lead, nickel, vanadium, zinc, benzene, bis(2-ethylhexyl)phthalate, beryllium, N-nitrosodiphenylamine, and total PCBs. A duplicate sample was taken from SW-1.

The only contaminant detected above its respective performance standard was arsenic which was detected at location SW-1 in the duplicate sample. The performance standard is 17.9 ppb and it was detected at 21 ppb. The original sample at that location did not detect arsenic. Other detected but below their respective performance standards were: antimony, beryllium, cadmium, lead, vanadium and zinc. Historically, surface water quality has been inconsistent with exceedances of performance standards. This may reflect difficulties in obtaining sediment free samples or capture of runoff from Turner Avenue.

Sediment

Sediment samples were collected from two location on September 9, 2003; SS-1 and SS-2. The samples were analyzed for antimony, arsenic, cadmium, lead, nickel, vanadium, zinc, benzene, bis(2-ethylhexyl)phthalate, beryllium, N-nitrosodiphenylamine, and total PCBs. A duplicate sample was taken from SS-1.

The only contaminant detected above its respective performance standard was antimony which was detected at location SS-1 at a concentration of 10 parts per million (ppm). The performance standard is 4.3 ppm. Antimony was not detected in the duplicate sample from this location. Other contaminants detected, but below the performance criteria were: arsenic,

beryllium, and lead. Cadmium, nickel, vanadium and zinc were detected but performance standards have not been established for these parameters. The antimony exceedance at SS-1 was the first exceedance of sediment performance criteria since September 2001.

Site Inspection

The inspection at the site was conducted on April 13, 2004. In attendance were Tim Prendiville, U.S. EPA; Lisa Summerfield, MDEQ; Andy Kok, Varnum, Riddering, Schmidt & Howlett; Scott Broekstra, Dykema Gossett; Bruce Visser, DBV Partners, LLC, Bill Mast, DBV Partners, LLC, and Brandon Hurl, Conestoga Rovers. The purpose of the inspection was to assess the protectiveness of the remedy, including the integrity of the asphalt, concrete and vegetated cover over the lead contaminated soils that were consolidated on site, and general conditions of the site.

A complete visual inspection of the remedy on the Visser property was conducted by the entire party. We performed a walk around of the property taking note of, exterior asphalt conditions, interior concrete slab conditions, and exterior landscape cover. Similarly a visual inspection of the Baker Auto remedy was conducted by Mr. Prendiville, Ms. Summerfield, Mr. Broekstra, and Mr. Hurl.

Visser Property

The asphalt cap was found to be in excellent condition. Only minor cracks in the asphalt were observed in a few locations, none of which posed a threat of full penetration of the cover. Minor repairs of the cover were observed in a few location.

The vegetated cover was also in excellent condition. Grass and other plant material were in excellent condition. There were no signs of erosion or penetration through the cover. Mr. Visser noted that no utility work has been necessary which would disturb the cover.

In each of the buildings minor cracking of the concrete slabs was noted. None of the cracks were greater than a quarter inch wide, and no exposure of the underlying soils was evident. Some caulking of cracks had recently been done in Building A.

Bolts were missing from the flush mount well cover at MW-1S and the plug with some plastic or other material stuffed into the riser. Ms. Summerfield suggested that permanent identification labels be placed on each well to provide for easy identification of the wells.

Baker Auto Property

The vegetated cover on the Baker Auto property was in generally good condition. The grass was a bit thin in areas, but of no general concern. The asphalt parking lot was also in good condition with no major cracks or other damage noted.

Bolts were missing from the well caps at MW-3S and MW-4S. The concrete pad surrounding MW I-16 was badly cracked and in disrepair.

VII. Technical Assessment

Question A: Is the remedy functioning as intended by the decision documents?

The review of documents, ARARs, risk assumptions, and the results of the site inspection indicates that the remedy is functioning as intended by the ROD and ROD Amendments. Consolidation and capping of the contaminated soils has achieved the remedial objectives to minimize the migration of contaminants to groundwater and surface water and prevent direct contact with, or ingestion of, contamination in soil. While the site inspection for this review has found no evident problems with the condition of the cover system, the owner of the property needs to ensure that the inspection and inspections documentation requirements of the O&M plans are fully implemented to ensure no future issues arise, and if they do they are identified as soon as possible. In addition, use restrictions need to be implemented at all of the affected parcels to ensure future owners and operators are aware of the risks associated with this site and to prevent exposure to the contamination. There are currently no exposures occurring on-site, and given the nature of the redevelopment and the need to keep cover system in good condition for the operation of the on-site businesses there is little risk for breach of the cover in the short-term while deed restrictions are put in place.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of remedy selection still valid?

There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy.

Changes in Standards

As the remedial work has been completed, the ARARs for soil contamination cited in the ROD and ROD Amendments have been met. A comparison of the soil cleanup standards to the current Michigan Part 201 standards in Attachment 3 shows that the ROD standards remain protective.

Attachment 3 also compares the groundwater cleanup standards established in the ROD to current Michigan Part 201 standards, MCLs. Standards for two contaminants have been lowered since the ROD was issued; the arsenic MCL has been lowered from 50 ppb to 10 ppb. Only two wells, MW-2S and MW-2I, have had detections of arsenic since 2000, and those detections were subsequently followed by rounds of non-detections. All other wells have been below detection limits for arsenic. Therefore, the change in the standard would have no effect on the protectiveness of the remedy. However, this should be re-evaluated if future rounds of groundwater monitoring detect arsenic consistently above 10 ppb.

The groundwater cleanup standard for lead was set at 1,420 in the ROD. The concentrations was based upon background samples taken at two wells and on unfiltered samples. Since implementation of the remedy 10 rounds of samples have been taken from 6

wells that are considered upgradient of the site. Concentrations at these wells are significantly lower than the background concentration used in establishing the cleanup standards. In general, most of the wells are non-detect for lead, and for those that have had lead detected, the concentration has been near the current Michigan Part 201 groundwater standard for lead (4.0 ppb). A re-evaluation of the groundwater cleanup standard for lead should be performed which at a minimum should include a recalculation of the background concentration of lead.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No weather-related events have affected the protectiveness of the remedy. There is no other information that calls into question the protectiveness of the remedy.

Technical Assessment Summary

There have been no changes in the physical conditions of the site that would effect the protectiveness of the remedy. There have been no changes in the toxicity factors for the contaminants of concern that were used in the baseline risk assessment, and there have been no changes to the standardized risk assessment methodology that could affect the protectiveness of the remedy.

VIII. Issues

Table 2: Issues

Issues	Affects Current Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
No documentation of periodic inspections	N	Y
Lead groundwater cleanup standard needs evaluation	N	Y
Deed restrictions	N	Y
A standard needs to be developed to determine when cracks in the cover need to be addressed.	N	Y

IX. Recommendations and Follow-up Actions

Table 3: Recommendations and Follow-up Actions

Issue	Recommendation and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness (Y/N)	
					Current	Future
No documentation of periodic inspections	Require Agency's receipt of inspection report for future rounds of inspections	PRP	EPA	10/13/04	N	Y
Lead groundwater cleanup standard needs evaluation	Recalculate background, issue ESD, if necessary	PRP	EPA	12/31/04	N	N
Deed Restrictions	Place deed restriction on section of property where residential standards are exceeded	PRP	EPA	5/28/05	N	Y
PRPs need to propose a standard to be incorporated into the existing O&M plans to determine when cracks in the cover need to be addressed	PRPs will propose a standard to the agencies for review, approval, and incorporation into the O&M Plans	PRP	EPA	9/30/2004	N	Y

X. Protectiveness Statement

The remedy at the H. Brown Company, Inc. Site is protective of human health and the environment in the short term because there is no evidence of cap breach and thus no current exposure. However, for the remedy to remain protective institutional controls must be put in place.

XI. Next Review

The next five-year review for the H. Brown Company, Inc., Site is required by May 28, 2009, five years from the date of this review.

Attachment 1

Documents Reviewed

September 2003, Monitoring Report, H. Brown Superfund Site, Walker, Michigan, Conestoga-Rovers, December 17, 2003.

Performance Standards Verification Plan, Pre-Final Design Submittal, Conestoga-Rovers, March 1999.

H. Brown Company, Inc. Superfund Site Unilateral Administrative Order, April 28, 1998.

Completion of Remedial Action Report, H. Brown Superfund Site, December 2003.

Prospective Purchaser Agreement, Covenant not to Sue, DBV Partners, LLC, V-W-'98-C-535, July 2, 1998.

Pre-Construction Meeting Minutes, Conestoga-Rovers, June 4, 1999.

Record of Decision Amendment, H. Brown Co., Inc. Site, Walker, Michigan, September 29, 1995.

Fourth Consent Decree, United States of America v. H. Brown Company, Inc. et al., Civil No. 1:96-CV-949, December 22, 1999.

Explanation of Significant Differences, H. Brown Co., Inc. Superfund Site, Walker, Michigan, April 5, 1999.

Pre-Final (95%) Design Amendment, H. Brown Superfund Site, Walker, MI, Conestoga-Rovers & Associates, April 13, 1999.

Monthly Progress Reports, September 2000 through February 2004, Conestoga-Rovers & Associates.

Superfund Preliminary Closeout Report, H. Brown Co, Inc. Site, September 19, 2000.

Record of Decision, H. Brown, Co., Inc. Site, Walker, Michigan, September 30, 1992.

Letter, Final Risk Assessment - Center Ditch Area, H. Brown Superfund Site, Walker, Michigan, Conestoga-Rovers & Associates, May 22, 2001.

Correspondence, Mr. Michael Lamancusa, Michigan Department of Transportation to Ms. Lisa Summerfield, Michigan Department of Environmental Quality, RE: Highway US-131 Drain

Cleanup, H. Brown Superfund Site, Walker, Michigan, November 15, 2001.

Landfill Gas Monitoring Report, Turner Commercial Center South (Former H. Brown Superfund Site), Walker, Michigan, Fishbeck, Thompson, Carr & Huber, Inc., June 24, 2003.

Final Risk Assessment - Center Ditch Area, H. Brown Superfund Site, Walker, Michigan, Conestoga-Rovers & Associates, August 10, 2000.

Landfill Gas Venting Design and Monitoring Plan, H. Brown Superfund Site, Fishbeck, Thompson, Carr & Huber, Inc., December 3, 1998.

Final Operation and Maintenance Plan, H. Brown Co., Inc. Site, Walker, Michigan, Conestoga-Rovers & Associates, August 24, 2000.

Final Construction Inspection Report, H. Brown Superfund Site, Walker, Michigan, Conestoga-Rovers & Associates, June 18, 2001.

Attachment 2

Applicable or Relevant and Appropriate Requirements				
Federal ARARs				
Authority	ARAR	Status	Requirement Synopsis	Action to be taken to Attain ARAR
SDWA	40CFR 141.11 - 16; 141.50-51; and 143.3	Relevant and appropriate	Standards (MCLs) have been adopted as enforceable standards for public drinking water systems; goals (MCLGs) are non-enforceable levels for such systems.	MCLs and non-zero MCLGs will be attained at the point of compliance. Remediation of contaminated materials will eliminate ongoing discharges to groundwater.
CAA	40CFR Part 50	Applicable	Requirements include the TSP standard for air discharges. Treatment methods which are part of the remedy are potential sources of fugitive dust, particles, and/or VOCs	Remediation technologies which emit air contaminants will attain the appropriate standard during operation
CWA	40 CFR 230.70-77	Applicable	Requires actions to minimize adverse effects of dredged or fill materials	Actions will be take to comply with all provisions of this regulation
RCRA	40CFR 264.18	Relevant and Appropriate	Standards specify that a facility located in a flood plain must be designed, constructed, operated, and maintained to prevent washout of hazardous wastes by a flood	Proper construction and management practices were utilized to prevent erosion and washout of hazardous wastes.
RCRA	40CFR 264	Applicable	Standards specify the closure requirements for hazardous waste disposal facilities.	This ARAR was waivedr pursuant to CERCLA Section 121 (d)(4)(D)

Authority	ARAR	Status	Requirement Synopsis	Action to be taken to Attain ARAR
OSWER Directive	OSWER Directive 9355.4-02	TBC	Directive sets interim soil lead cleanup standards at 500-1000	A cleanup standard of 400 ppm was applied to the site.
Executive Order	Wetlands Management Exec. Order 11990	TBC	Order requires federal agencies to avoid to the extent practicable, the long- and short-term adverse impacts associated with the destruction modifications of wetlands	Appropriate construction practices were used to minimized impacts to the wetlands.
Executive Order	FloodPlain Management Executive Order 11988	TBC	Order requires minimization of potential harm to or within floodplains and the avoidance of long- and short-term adverse impacts associated with the occupancy and modification of flood plains	Appropriate construction practices were used to minimized impacts to floodplains.
STATE ARARS				
State ARARs - Note: NREPA refers to Michigan's PA451, as amended, 1994, the Natural Resources and Environmental Protection Act				
NREPA	Part 303	Relevant and Appropriate	Outlines requireents for conservation of wetlands whose capacity for erosion control serves as a sedimentation area and filtering basin absorbing silt and organic matter	Actions required to maintain the soil erosion control capabilities of wetlands onsite.
NREPA	Part 201	Relevant and Appropriate	Presents the substantive criteria and procedures for evaluating cleanup of CERCLA type hazardous waste sites in Michigan.	The substantive criteria for establishing cleanup standards and remedial action activities at the site

Authority	ARAR	Status	Requirement Synopsis	Action to be taken to Attain ARAR
NREPA	Part 55	Relevant and Appropriate	Outlines requirements for prohibiting emission of air contaminants of water vapors in quantities that cause, alone or in reaction with other air contaminants, either of the following: (a) Injurious effects to human health or safety, animal life, plant life of significant economic value or property; (b) Unreasonable interference with comfortable enjoyment of life and property.	Actions required by U.S. EPA to limit emissions from onsite units or activities that will adversely affect ambient air quality.
Michigan Act 451	Part 201, Rule 719(3)	Applicable	Rule requires restrictive covenants to be placed on the site.	Appropriate restrictive covenants are to be placed on all affected parcels
NREPA	Part 91	Applicable	Rule regulates earth changes which may contribute to soil erosion and sedimentation to surface waters of the State	Proper construction and management practices were employed to minimize potential impacts to the Grand River
NREPA	Part 111	Applicable	Rule requires an impermeable cover of hazardous waste disposal units.	ARAR was waived pursuant to CERCLA Section 121(d)(4)(D)
NREPA	Part 115	Relevant and Appropriate	Rule requires construction of an impermeable cover over solid waste disposal units	If selected remedy fails to achieve standards a cover complying with Part 115 requirements would be required to be built.
Michigan Public Health Code Act 368 of 1978	Part 127	Applicable	Rule requires proper construction and abandonment of private drinking water wells	Wells were constructed and abandoned in accordance with regulation

Authority	ARAR	Status	Requirement Synopsis	Action to be taken to Attain ARAR
NREPA	Part 301	Applicable	Act regulates construction activities on or over bottomlands and streams.	Construction and management practices were put in place to minimize potential run-off, erosion, silting, and sedimentation.
NREPA	Part 625	Relevant and Appropriate	Rules regulate location, construction and abandonment of monitoring and test wells	All requirement were met as part of construction of the monitoring wells

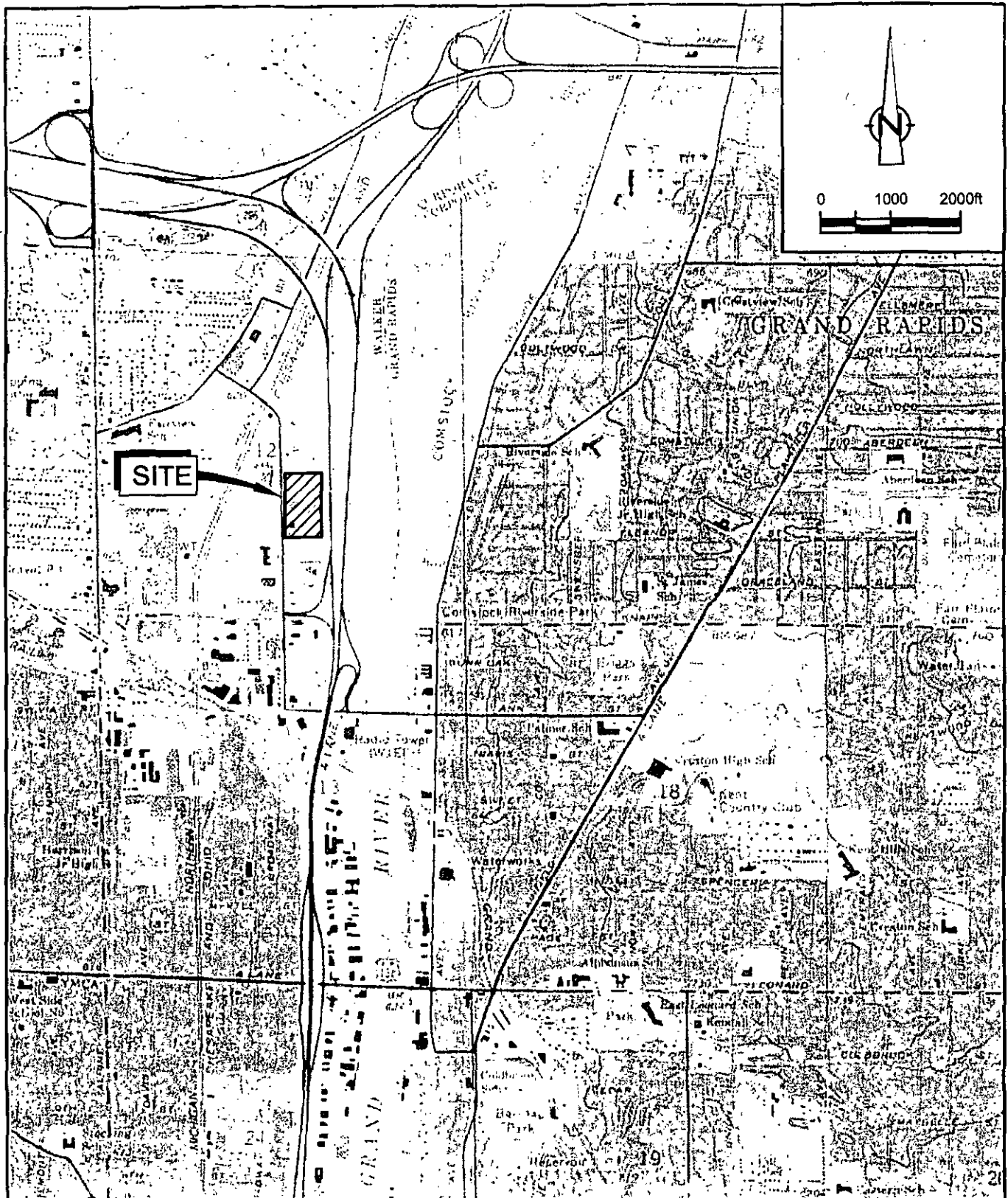
Attachment 3

Comparison of Site's Groundwater Target Concentration Limits (TCLs) to Current Michigan Part 201 Residential Drinking Water Criteria			
Chemical	ROD TCLs (ppb)	2004 MI Part 201 Industrial/Commercial II, III & IV Drinking Water Criteria (ppb)	2002 Federal MCL (ppb)
Antimony	5.0 (ARAR)	6.0	6.0
Arsenic	17.9 (ARAR)	50	10
Cadmium	4.0 (ARAR)	5.0	5.0
Lead	1,420 (Background)	4.0	-
Nickel	103 (ARAR)	100	-
Vanadium	68.1 (Background)	62	-
Zinc	4,670 (ARAR)	5,000	-
Benzene	1.0 (ARAR)	5.0	5.0
Bis(2-ethylhexyl)phthalate	5.0 (ARAR)	6.0	-

(-) - No standard has been established

Figures

FIGURE 1



SOURCE: USGS QUADRANGLE MAPS;
CEDAR SPRINGS SW AND GRAND RAPIDS WEST, MICH.



CRA

GRAND RAPIDS
MICHIGAN

figure 1.1

SITE LOCATION
H. BROWN SUPERFUND SITE
Walker, Michigan

FIGURE 2

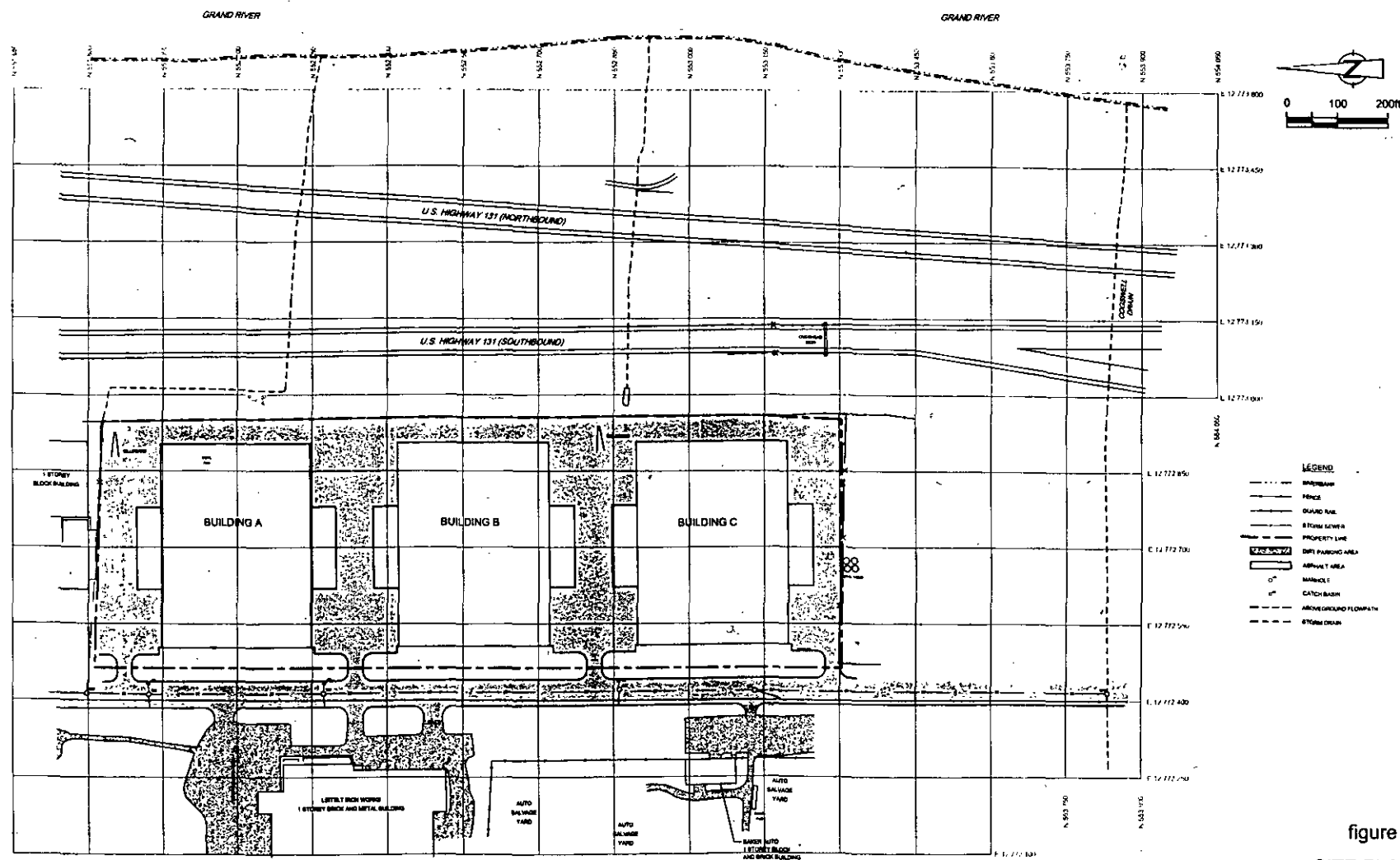


figure 2
SITE PLAN
H. BROWN SUPERFUND SITE
Walker, Michigan

FIGURE 3

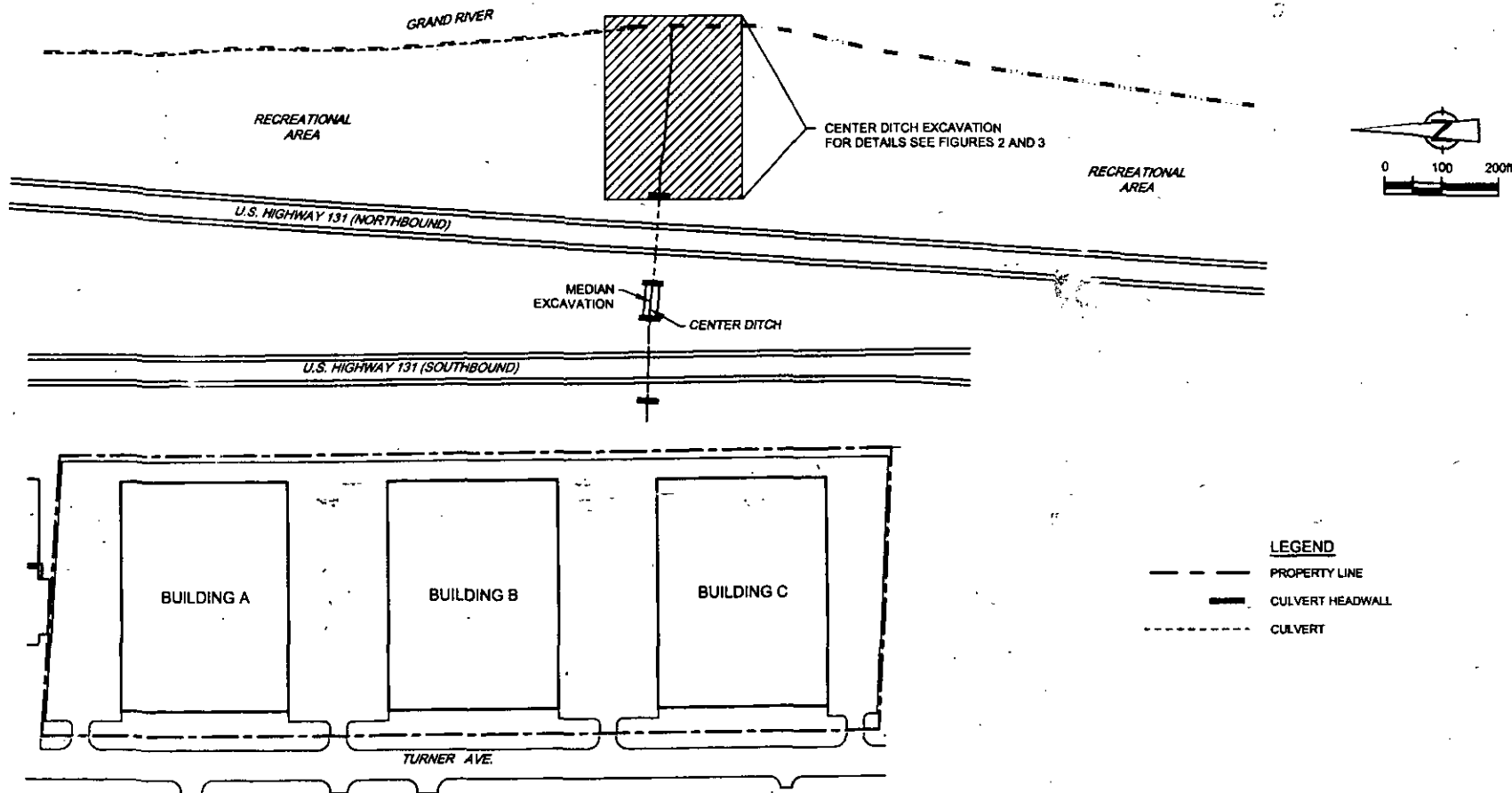


figure 1

SITE PLAN
H. BROWN SITE
Grand Rapids, Michigan

